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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the Transport of Dangerous Goods
(Thirteenth session,
Geneva, 7-17 July 1997,
agenda item (3 (d))

DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Other draft amendments

Reclassification of UN 2054, Morpholine */

Transmitted by the Expert from the United States of America

1. The Expert from the United States has determined that Morpholine, UN 2054, meets the criteria for Class 8, Packing Group I in addition to the criteria for Class 3, Packing Group II. The attached data sheet supports this position. On this basis it is proposed that Morpholine, UN 2054 be assigned to Class 8, Packing Group I with a Class 3 subsidiary risk.

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*/ *Note by the secretariat: The Committee at its nineteenth session agreed that proposals concerning listing and classification should be restricted to the classification of new substances, and that reclassification of existing substances should be avoided as far as possible as long as the process of global harmonization has not been completed (ST/SG/AC.10/23, para. 212).*

Proposal

2. The following amendments are proposed:

a) In the Dangerous Goods List amend the entry for Morpholine as follows:

UN No.	Name and Description	Class or Division	Subsidiary risk	UN packing group	Special provisions	Limited Quantities	Packagings and IBC's		Portable Tanks	
							Packing Instruction	Special Require-ments	Portable Tank Instruction	Special Require-ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2054	MORPHOLILNE	8	3	I		NONE	P001		T20	TP2

(b) Revise the Alphabetical Index of Substances and Articles as follows:

MORPHOLINE 8 2054

Figure 1.1

DATA SHEET FOR SUBSTANCES SUBMITTED TO THE UNITED NATIONS FOR NEW OR AMENDED CLASSIFICATION

Submitted by David L. Ford, Huntsman Corporation
Date: April 17, 1997

Section 1. SUBSTANCE IDENTITY

1.1 Chemical name. . . . . **MORPHOLINE** . . . . . .

1.2 Chemical formula . . . . . C_4H_9NO . . . . . .

1.3 Other names/synonyms. . . .TETRA-HYDRO-1, 4 OXAZINE . . . . . .

1.4.1 UN number . . .2054 . . . . . 1.4.2 CAS number. . .110-91-8 . . . . . .

1.5 Proposed classification for the Recommendations

1.5.1 proper shipping name (13.8 */) MORPHOLINE

1.5.2 class/division . . .8 . . . . . subsidiary risk(s). . . . 3 . . . . . .

packing group . . .I . . . . . .

1.5.3 proposed special provisions, if any . . .NONE . . . . . .

1.5.4 proposed packing method . . .P001 . . . . . .

Section 2. PHYSICAL PROPERTIES

2.1 Melting point or range -5 °C

2.2 Boiling point or range 128.3 °C

2.3 Relative density at :

2.3.1 15 °C 1.007

2.3.2 20 °C 1.003

2.3.3 50 °C 975

THAT IS SPECIFIC GRAVITY RELATED TO WATER

2.4 Vapour pressure at :

2.4.1 50 °C 5.3 kPa

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*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

2.4.2 65 °C 10.6 kPa

2.5 Viscosity at 20 °C (1.10 */) $2.3x10^{6}$ m^2/s

2.6 Solubility in water at 20 °C .... g/100 ml INFINITELY SOLUBLE

2.7 Physical state at 20 °C (1.10 and 1.15 */) **liquid**

2.8 Appearance at normal carriage temperatures, including colour and odour

COLORLESS LIQUID; AMMONIA-LIKE ODOR

2.9 Other relevant physical properties NONE

Section 3. FLAMMABILITY

3.1 Flammable vapour

3.1.1 Flash point (5.4 */) 35. . . °C oc/cc
3.1.2 Is combustion sustained? (5.7 */) yes

3.2 Autoignition temperature 310 °C

3.3 Flammability range (LEL/UEL) 1.8/10.8%

3.4 Is the substance a flammable solid ? no

3.4.1 If yes, give details (also complete 4.5.1 and 4.5.2 if relevant)(1.21 */)

Section 4. CHEMICAL PROPERTIES

4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity ? no

If yes, state

4.1.1 Inhibitor/stabilizer used
4.1.2 Alternative method
4.1.3 Time effective at 55 °C
4.1.4 Conditions rendering it ineffective

4.2 Does the substance react with water ? no

4.2.1 If yes, state effects

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*/ *This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

4.3 Does the substance have explosive properties ? (4 */) no

4.3.1 If yes, give details . . . . . .

4.4 Does the substance have oxidizing properties ? (1.22 */) no

4.4.1 If yes, give details . . . . . .

4.5 Is the substance a self-reactive substance (1.21 */) or an organic peroxide (1.22*/)? no

If yes, is temperature control required (11.3.5/14.2.2.5 */)? no

If yes state

4.5.1 proposed control temperature (11.3.5.3 */) . . . . °C

4.5.2 proposed emergency temperature (11.3.5.3 */) . . . . °C

4.6 Corrosivity (8 */) to :

4.6.1 mild steel < 3. . mm/year at . . . . °C

4.6.2 aluminium < 3. . mm/year at . . . . °C

4.6.3 other packaging materials (specify) . . . . . < 3 . mm/year at . . . . °C

4.7 Other relevant chemical properties CORROSIVE TO ALUMINUM AT ROOM TEMPERATURES ABOVE 66.6 °C OR WHEN IN AQUEOUS SOLUTIONS . . . . . .

Section 5. HARMFUL BIOLOGICAL EFFECTS

5.1 LD 50, oral (6.2.1*/) 1050 . mg/kg Animal species RAT . . . . . .

5.2 LD 50, dermal (6.2.2*/) 500. . mg/kg Animal species . . . . . .

5.3 LC 50, inhalation (6.2.3*/) N/D. . mg/litre Exposure time . . . . . hours

or . . . ml/m^3 Animal species . . . . . .

5.4 Saturated vapour concentration at 20 °C (6.3.3 */) . .N/D . . ml/m^3
8.0/8.0 DRAIZE

**/ This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*

5.5 Skin exposure (8 */) results CORROSIVE Exposure time 4 HOURS . . . . . hours/minutes
PACKING GROUP I Animal species RABBIT . . . . . .

5.6 Other data . . . . . .
. . . . . .

5.7 Human experience NOT KNOWN . . . . . .
. . . . . .

Section 6. SUPPLEMENTARY INFORMATION

6.1 Recommended emergency action

6.1.1 Fire (include suitable and unsuitable extinguishing agents)

USE WATER SPRAY, DRY CHEMICAL, ALCOHOL RESISTANT FOAM OR CARBON DIOXIDE TO EXTINGUISH FIRE . . . . . .

6.1.2 Spillage CONTAIN SPILL IF POSSIBLE, REMOVE WITH INERT ABSORBENT, PREVENT ENTRY INTO SEWERS AND WATERWAYS . . . . . .

6.2 Is it proposed to transport the substance in :

6.2.1 Intermediate Bulk Containers (16 */) ? no

6.2.2 Multimodal tanks (12 */) ? yes

If yes, give details in Sections 7 and/or 8.

Section 7. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 6.2.1)

7.1 Proposed type(s) None - PG I liquids are not authorized in IBCs.

Section 8. MULTIMODAL TANK TRANSPORT (only complete if yes in 6.2.2)

8.1 Description of proposed tank (including IMO tank type if known)
IMO TYPE I or TYPE 1M-101 (US-DOT) . . . . . .
TANK MATERIAL TO BE STAINLESS STEEL . . . . . .

8.2 Minimum test pressure 4 BAR . . . . . .

8.3 Minimum shell thickness 6mm . . . . . .

8.4 Details of bottom openings, if any NO BOTTOM OPENINGS . . . . . .

8.5 Pressure relief NORMAL TYPE PRECEDED BY A FRANGIBLE DISC IN SERIES . . . . . .

8.6 Degree of filling FILLING IAW 4.2.1.9.3 -TP2 . . . . . .

8.7 Unsuitable construction materials ALUMINUM . . . . . .

**/ This and similar references are to chapters and paragraphs in the Recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods (ninth revised edition).*